



## 1<sup>st</sup> MGS - GEOSS GEOTECHNICAL CONFERENCE 2019

*(A geotechnical collaboration between Malaysia & Singapore)*

***"Geotechnics in Urban Infrastructure"***

**24 - 26 June 2019**

**Hilton Petaling Jaya, Selangor, MALAYSIA**



## **CONFERENCE PROGRAMME BOOKLET**

**Jointly Organized by: -**

**Malaysian Geotechnical Society (MGS) & Geotechnical Society of Singapore (GeoSS)**



*Member Societies of International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE)*

**Supported by: -**

**Geotechnical Engineering Technical Division, The Institution of Engineers, Malaysia (GETD, IEM)**



**Event Sponsors: -**



**Event managed by:**



“ Strainstall Malaysia is one of the subsidiaries of James Fisher Group of Company UK, has over 45 years of experience in pile testing, structural monitoring and components. Our team of qualified mechanical, electronic, civil and structural engineers are well equipped to develop solutions to most instrumentation and monitoring requirements across all engineering sectors. ”

## Pile Testing and Monitoring Specialist

Strainstall Malaysia is a professional engineering company that specialises in providing high strain dynamic pile testing, analysis, pile integrity testing, consulting services and other specialist pile testing services for the foundation engineering industry. We have been involved in many large pile testing projects across South East Asia and the Middle East, including High Strain Dynamic Pile Testing and Bi-Directional Static Load Tests.

To enable us to provide high quality pile testing services, we own state of the art equipment and computer software. The systems we use are market leading brands, and their reliability is proven through thousands of field tests conducted every year both in Malaysia and worldwide. Strainstall Malaysia has attained the MS ISO/IEC 17025 accreditation under the Laboratory Accreditation Scheme of Malaysia for both pile testing and calibration. Our unique combination of advanced equipment technology and pile testing expertise has helped us to be more effective in serving our customers.

### Areas of Pile Testing and Monitoring Expertise

- Bi Directional Static Load Testing (BDSLT)
- High Strain Dynamic Pile Testing (PDA)
- Low Strain Pile Integrity Testing (PIT)
- Cross-Hole Sonic Logging
- PileSentinel



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## Structural Monitoring

The structural monitoring services provided by Strainstall include the short and long term monitoring of complete structures such as bridges, plant and buildings, as well as structural monitoring of components of large marine vessels, road and rail vehicles and aero structures. These range from static data logger systems to high speed/high data rate dynamic monitoring systems with intelligent data processing and reduction instrumentation. A wide range of sensors are used to measure parameters such as strain, stress, load, acceleration, displacement, vibration, temperature and pressure. Strainstall's structural monitoring experience provides the right sensors together with the right monitoring instrumentation, to give the client the right service and answers.



### Structural Monitoring Areas of Expertise

- Bridges
- Buildings
- Energy Industry
- In-situ Stress
- Crack Monitoring
- Deflection/Displacement
- Dynamic Testing
- CrackFirst
- General Testing

## Structural Health Monitoring Systems

One of the world's leading structural monitoring specialists. With an unrivalled track record since 1966, the company's innovation in the field of structural monitoring is significant, as we continuously strive to provide cuttingedge solutions, providing value for our customers.

Our solutions include the short-and long-term monitoring of complete structures such as bridges and buildings, as well structural monitoring of components of large marine vessels, road and rail vehicles, aerostructures and wind turbines.



# CONTENT

1	Introduction
2	Conference Theme
3	Message by Organising Chairman
4	Message by Co-Organising Chairman
5	Conference Organising Committee
6	Conference Programme
7	List of Technical Papers Received <i>(Please refer to thumbdrive for full paper)</i>
8	Opening Address, Keynote Title & Abstract <i>(Please refer to thumbdrive for full paper)</i>
9	MGS & YMGS Committee Members Session 2018/2019
10	GeoSS & SYGeoSS Committee Members Session 2018/2019
11	Guidelines for Participants
12	Conference Sponsors
13	Conference Exhibitors
14	Conference Advertisers
15	Acknowledgement

# INTRODUCTION

The 1<sup>st</sup> Malaysian Geotechnical Society - Geotechnical Society of Singapore Geotechnical Conference (1MGSSGC) will be held on 24 - 26 June 2019 at Hilton Petaling Jaya, Selangor, Malaysia. On 3 November 2017, MGS and GeoSS have signed a Memorandum of Understanding, where both parties agreed to jointly organise a Geotechnical Conference every 2 years, hosted alternately. This inaugural 1MGSSGC to be held in Selangor, Malaysia is expected to be well supported by academicians and practitioners. The Conference will have an Opening Address and Keynote Lectures to be delivered by distinguished geotechnical experts and eminent academicians. More than 40 contributed papers from Malaysia, Singapore, as well as overseas countries will be presented at the Conference.

Infrastructure spend in both countries has been significant over the past few years with implementation of mega projects like Light Rail Transit, Mass Rapid Transit, Deep Tunnel Sewerage Systems, etc. Sustainable urban development has been the hallmark of many such projects and the need to improve productivity by reducing reliance on labour, the intent of both Malaysia and Singapore authorities. Much geotechnical knowledge in design and construction has been gained, including state of the art quality, safety and technological smarts applied on sites. Not surprisingly, construction techniques applied in one of the toughest geology in Kuala Lumpur Limestone, and the safe-efficient transportation system in Singapore are considered world class.

This conference affords the perfect opportunity for the exchange of know-how and lessons learnt between Malaysian and Singaporean practitioners, academicians and authorities, and is certainly not to be missed.

## CONFERENCE THEME

The Conference theme is **Geotechnics in Urban Infrastructure**.

Sub themes include:

- Soil Characterization and Properties
- Ground Improvement and Stabilization
- Shallow and Deep Foundations
- Excavations and Retaining Structures
- Field Testing and Performance Monitoring
- Engineering Geology and Rock Mechanics
- Design Analysis and Modelling
- Tunnelling and Underground Space Development

## MESSAGE BY ORGANISING CHAIRMAN

**T**he Malaysian Geotechnical Society (MGS) was formed 7 years ago by a small group of passionate geotechnical engineers. The occasion marked the coming of age of the fraternity of geotechnical engineers to join the International Society (ISSMGE) in her own right, having been guided by SEAGS before that.

MGS has grown tremendously over these years with the support of many individuals and organisations. There are too many to name. Among all these, GeoSS has been a fine example to follow. This inaugural MGS-GeoSS Geotechnical Conference signifies our close cooperation and special relation.

I would like to take this opportunity to thank the Organising Committee for their unfeigned efforts. I want to thank all the Keynote Speakers, Presenters and participants without whom we would not have a conference. Much appreciation goes to our Sponsors, Exhibitors and Advertisers for helping defray costs for such an event; the continued support of commercial organisations to MGS has been resounding.

We welcome our overseas visitors, especially GeoSS members and the ISSMGE President, Prof. Charles Ng. And to all participants, have a great conference, take time to get to know new friends and enjoy the deliberations.



Ir. YEE Yew Weng  
President Session 2018/2019, Malaysian Geotechnical Society  
Organising Chairman, 1<sup>st</sup> MGS-GeoSS Geotechnical Conference 2019

## MESSAGE BY CO-ORGANISING CHAIRMAN

Before MGS and GeoSS were formed, there were already frequent communications and interaction among engineers from Singapore and Malaysia through Southeast Asian Geotechnical Conferences held once in two to three years as well as geotechnical conferences held in Singapore and Malaysia for the past decades. The notable ones include the 6th Asian Regional Conference on Soil Mechanics and Foundation Engineering held in Singapore in 1979 and the 12th Asian Regional Conference on Soil Mechanics and Foundation Engineering held in Singapore in 2003.

After MGS and GeoSS were formed, the two societies had delegations visiting each other. It is timely that the inaugural MGS-GeoSS Geotechnical Conference be held to mark the first major event for interaction on geotechnical knowhow and exchange of new ideas on geotechnical works in the two countries and beyond.

On behalf of the Singapore delegation, we wish that this inaugural conference be a resounding success and look forward to hosting the second joint geotechnical conference in Singapore in near future.



Er. Chandrasegaran SUNDARARAJU  
President Session 2018/2019, Geotechnical Society of Singapore



Prof. LEUNG Chun Fai  
Co-organising Chairman, 1<sup>st</sup> MGS-GeoSS Geotechnical Conference 2019

## CONFERENCE ORGANISING COMMITTEE

<b>Chairman:</b>	Ir. Yee Yew Weng
<b>Co-Chairman:</b>	Prof. Leung Chun Fai
<b>Deputy Chairman:</b>	Ir. Liew Shaw Shong
<b>Secretary General:</b>	Adeline Moo Hong Shin Chriswini Tanaka
<b>Treasurer:</b>	Ir. Dr Chan Swee Huat Dr Leong Kam Weng
<b>Technical Paper:</b>	Ir. Dr Dominic Ong Ek Leong Dr Ng Tiong Guan
<b>Hotel &amp; Exhibition:</b>	Vincent Ong Yung Sheng Ir. Dr Ong Chee Wee
<b>Advertisement &amp; Sponsorship:</b>	Ir. Assoc. Prof. Dr Ong Chee Wee
<b>Site Visit:</b>	Ir. Dr Chin Yaw Ming

# CONFERENCE PROGRAMME

## DAY 1: MONDAY, 24 JUNE 2019

Time/Date	Monday, 24 June 2019	
9:00 am - 9:15 am	<b>Session Chairs: Ir. Yee Yew Weng &amp; Prof. Leung Chun Fai</b>	
	<b>Opening Ceremony</b>	
9:15 am - 10:00 am	<b>Opening and ISSMGE Presidential Address by Prof. Charles Ng</b> "Impact Mechanisms of Debris Flow on Rigid and Flexible Barriers"	
10:00 am - 10:45 am	<b>Keynote 1: Prof. Phoon Kok Kwang</b> "Model Factors for Foundation Design - A Comprehensive Review"	
10:45 am - 11:15 am	<b>Tea Break</b>	
11:15 am - 12:45 pm	<b>Session Chair: Dr. Hong Sze Han &amp; Co-chair: Ir. Dr. Dominic Ong</b>	<b>Session Chair: Ir. Dr. Tan Yean Guan &amp; Co-chair: Er. Chua Tong Seng</b>
	<b>Shallow and Deep Foundations</b>	<b>Field Testing and Performance Monitoring</b>
11:15 am - 11:30 am	Challenges of Pile Foundation in Limestone Foundation in Kuala Lumpur, Malaysia	Assessment of Long Reinforced Concrete Piles Response under Axial Load Test using Distributed Fibre Optic Strain Sensor
11:30 am - 11:45 am	Review of Interpretation Method of Global Strain Measurement in Pile Testing	Real-time Evaluation of Tunnel Face Condition using Laser Distance Measurer
11:45 am - 12:00 pm	Effectiveness of Pile Debonding Materials with Pile Global Strain Measurement	A Novel Approach to the Performance Evaluation of a 2500mm Ø Working Test Bored Pile Using Bi-Directional Static Load Test (BDSLT) Method
12:00 pm - 12:15 pm	Hand-Dug Caisson Piles in Granitic Formation, Penang	Design and Construction of Driven Piles Over Klang Clay
12:15 pm - 12:30 pm	Measurement of Shaft Friction of Bored Pile in Granite Formation	Rainfall Thresholds for Forecasting Landslides in Singapore
12:30 pm - 12:45 pm		
12:45 pm - 2:00 pm	<b>Lunch Break</b>	
02:00 pm - 02:45 pm	<b>Session Chair: Ir. Dr. Ooi Teik Aun &amp; Co-chair: Ir. Llew Shaw Shong</b>	
	<b>Keynote 2: Ir. Dr. Chan Sin Fatt</b> "Managing Geotechnical Risks in Engineering Practice"	
02:45 pm - 03:30 pm	<b>Keynote 3: Prof. Leung Chun Fai</b> "Effects of Tunnelling on Adjacent Buildings and Foundations"	
03:30 pm - 04:00 pm	<b>Tea Break</b>	
04:00 pm - 05:15 pm	<b>Session Chair: Ir. Dr. How You Chuan &amp; Co-chair: Ir. Dr. Ong Chee Wee</b>	<b>Session Chair: Ir. Chong Yeong Yuan &amp; Co-chair: Er. Michelle Lew</b>
	<b>Soil Characterisation and Properties</b>	<b>Excavation and Retaining Structures</b>
04:00 pm - 04:15 pm	Recent Advancements in Fundamental Studies of Particulate Interaction and Mechanical Behaviour using 3-D Printed Synthetic Particles	Numerical Study of Groundwater Drawdown Effects on Ground Settlement for Braced Excavations in Singapore Bukit Timah Granitic Residual Soils
04:15 pm - 04:30 pm	Evaluation of Deformation and Strength Characteristics of Soils by Falling Ball Inspection and its Practical Use for Quality Control	Performance Monitoring of Blast Induced Vibrations at Deep Excavations on Surrounding Structures
04:30 pm - 04:45 pm	Usage of Pressuremeter Tests in Highly Fractured and Weathered Phyllite for the Assessment of Jacking Forces	Impact Assessment On Existing Building Due to Deep Excavation
04:45 pm - 05:00 pm	Generalised Tangential Approach for Characterisation of Strength Parameters for Pipe-Jacking Work in Weathered Rocks	Application of Observational Method in ERSS System
05:00 pm - 05:15 pm	Interpretation of Nuclear-Density Cone Penetrometer for Layered Soils	Valuable Lessons Learnt from Case Histories of Singapore Underground Transit Construction and Future Challenges

# CONFERENCE PROGRAMME

## DAY 2: TUESDAY, 25 JUNE 2019

Time/Date	Tuesday, 25 June 2019	
9:00 am - 9:45 am	<b>Session Chair: Ir. Dr. Tan Yean Chin &amp; Co-chair: Er. Dr. Ng Tiong Guan</b> <b>Keynote 4: Ir. Dr. Ooi Lean Hock</b> <b>"Underground Works in Karsts - Some Malaysian Experience"</b>	
9:45 am - 10:15 am	<b>Malaysia Young Geotechnical Engineer Presentation by Assoc. Prof. Ir. Dr. Hisham Mohamad</b> <b>"State-of-the-art Instrumentation of Slopes and Retaining Structures with Fibre Optic"</b>	
10:15 am - 10:45 am	<b>Singapore Young Geotechnical Engineer Presentation by Er. Dr. Ooi Poh Hai</b> <b>"Application of Soil Nailing For Basement Construction in Urban Area"</b>	
10:45 am - 11:15 am	<b>Tea Break</b>	
11:15 am - 12:45 pm	<b>Session Chair: Ir. Dr. Lee Sieng Kai &amp; Co-chair: Ir. Lo Chong Chiun</b> <b>Tunnelling and Underground Space Development</b>	<b>Session Chair: Ir. Chen Chean Sin &amp; Co-chair: Ir. Jack Wong</b> <b>Design Analysis and Modelling</b>
11:15 am - 11:30 am	Design Case Study of MRT Station with Mined Tunnels in Mumbai Metro Line 3	Design and Settlement Monitoring of Embankment on Soft Ground in Southwest Sabah
11:30 am - 11:45 am	Key Construction Method in the Cross Passages Construction at Thomson East Coast Line T217, Singapore	Dynamic Cone Penetration (DLP) Data Analysis in Designing Shallow Foundation
11:45 am - 12:00 pm	Urban Tunnelling in Bukit Timah Granite By Slurry Mixshield at Thomson East Coast Line T217, Singapore	A Finite Element Study of an Excavation Not Amendable to Geometric Simplification
12:00 pm - 12:15 pm	SCL Tunnel Construction Underneath Existing MRT Tunnels with Jet Grouting Pile and Artificial Ground Freezing	Performance and 3D Numerical Analysis of 11m Deep Strut-Free Wide Excavation in Kenny Hill Formation
12:15 pm - 12:30 pm	Design Challenges of Bored Tunnelling for Deep Underground Water Pipe Installation in Downtown Singapore	Geotechnical Design and Construction Aspects for an Underground Cut-and-Cover Tunnel Over an Existing Road Tunnel Box
12:30 pm - 12:45 pm	Highrise Development in Limestone Formation Interfacing With MRT Tunnels	Reliability-based Design Criteria of Post Construction Settlement and Global Stability for Port Reclamation in Kalibaru, Indonesia
12:45 pm - 2:00 pm	<b>Lunch Break</b>	
02:00 pm - 02:45 pm	<b>Session Chair: Ir. E.G. Balakrishnan &amp; Co-chair: Dr. Leong Kam Weng</b> <b>Keynote 5: Ir. Dr. Toh Cheng Teik</b> <b>"Effects of Bored Pile Installation and Deep Excavation on Surroundings"</b>	
02:45 pm - 03:30 pm	<b>Keynote 6: Er. Chua Tong Seng</b> <b>"Ground Freezing for a Rail Project in Singapore"</b>	
03:30 pm - 04:00 pm	<b>Tea Break</b>	
04:00 pm - 05:15 pm	<b>Session Chair: Ir. Lee Plier Tien &amp; Co-chair: Jonathan Daramalinggam</b> <b>Ground Improvement and Stabilisation</b>	<b>Session Chair: Dr. M. Karthikeyan &amp; Co-chair: Ir. Dr. Chan Swee Huat</b> <b>Engineering Geology and Rock Mechanics</b>
04:00 pm - 04:15 pm	Desk Study of Deep Fill for a Building Platform	CI and CKo Triaxial Tests for Tropical Residual Soil in Malaysia
04:15 pm - 04:30 pm	Geosynthetic Concrete Formworks for Pipeline Covers Enhancing the Safety against Buoyancy, Uplift and Mechanical Damages	Transparent Soil Model Testing on Arching Effect of Passive Piles Subjected to Lateral Soil Movement
04:30 pm - 04:45 pm	Specifying Strength Properties of Soil Mixing and Jet Grouting in Malaysia: A Statistical Approach	Interpretation of CU and CD Triaxial Tests on Singapore Old Alluvium Soils
04:45 pm - 05:00 pm	Overcoming Challenges of Developments Interfacing With Railway Structures in the Klang Valley	Geotechnical Engineering of Ex-Quarry Site Redevelopment



# CONFERENCE PROGRAMME

## DAY 3: WEDNESDAY, 26 JUNE 2019

Time/Date

Wednesday, 26 June 2019

### SITE VISIT - Option of Site A or Site B

#### Site A. MRT Information Centre & Chan Sow Lin MRT Station

*Visit includes briefing on MRT tunneling works,  
TBM Control Centre (live feed)  
& viewing station pit.*



9:00 am - 12:45 pm

#### Site B. Pavilion Damansara

*Visit to 5-10 levels basement of deep excavation  
with CBP retaining wall (semi top down method).*



# LIST OF TECHNICAL PAPERS RECEIVED

No.	Author(s) - Paper Title
1	<b>C.C. Ng, C.W. Ong, W.K. Lai, M.H. Ang, C.K. Lee, P. Kiong</b> - Challenges of Pile Foundation in Limestone Foundation in Kuala Lumpur, Malaysia
2	<b>C.W. Ong, C.C. Ng, W.K. Lai, M.H. Ang, C.K. Lee, T.A. Ooi, K.Y. Yong, C.W. Neo</b> - Overcoming Challenges of Developments Interfacing with Railway Structures in the Klang Valley
3	<b>C.C. Ng, C.W. Ong, M.H. Ang, C.K. Lee, M. Tang, R. Vijaya Ragavan, T.A. Ooi, K.Y. Yong</b> - Design Case Study of MRT Station with Mined Tunnels in Mumbai Metro Line 3
4	<b>C.C. Ng, C.W. Ong, P.Y. Ng, L.G. Lee, K.W. Yong, T.A. Ooi, J.M. Soh, C.W. Neo</b> - Valuable Lessons Learnt from Case Histories of Singapore Underground Transit Construction and Future Challenges
5	<b>W.G. Zhang, R.H. Zhang, A.T.C. Goh</b> - Numerical Study of Groundwater Drawdown Effects on Ground Settlement for Braced Excavations in Singapore Bukit Timah Granitic Residual Soils
6	<b>P.L. Teo, T.Z.D. Moe, P. Teo, Y. Ogawa, K.S. Wong</b> - Interpretation of CU and CD Triaxial Tests on Singapore Old Alluvium Soils
7	<b>Nicholas K.K. Fong, D.M. Yong, N. Ramesh</b> - Key Construction Method in the Cross Passages Construction at Thomson East Coast Line T217, Singapore
8	<b>Nicholas Fong K.K., D.M. Yong, N. Ramesh</b> - Urban Tunnelling in Bukit Timah Granite by Slurry Mixshield at Thomson East Coast Line T217, Singapore
9	<b>D. Zhou, C.Y. Yang, W.G. Zhang</b> - Transparent Soil Model Testing on Arching Effect of Passive Piles Subjected to Lateral Soil Movement
10	<b>H. Tada, K. Hashida, S. Takeda, T.S. Chua, Michelle Lew, S. Marican, R.S. Nair</b> - SCL Tunnel Construction Underneath Existing MRT Tunnels with Jet Grouting Pile and Artificial Ground Freezing
11	<b>C.M. Chow, W.S. Teh</b> - Highrise Development in Limestone Formation Interfacing with MRT Tunnels
12	<b>S.H. Hong, S.S. Chong, R.C. Barallas</b> - A Finite Element Study of an Excavation Not Amendable to Geometric Simplification
13	<b>J.J. Tan, Y.M. Chin</b> - Desk Study of Deep Fill for a Building Platform
14	<b>K.M. Azizi, Y.M. Chin</b> - Geotechnical Engineering of Ex-Quarry Site Redevelopment
15	<b>M.M. Yohannes, J. Daramalinggam</b> - Specifying Strength Properties of Soil Mixing and Jet Grouting in Malaysia: A Statistical Approach
16	<b>K.H. Law</b> - Performance and 3D Numerical Analysis of 11m Deep Strut-Free Wide Excavation in Kenny Hill Formation
17	<b>S.A. Kulkarni, D.M. Yong, A. Xinmei, M. Aung</b> - Performance Monitoring of Blast Induced Vibrations at Deep Excavations on Surrounding Structures
18	<b>J.X Lim, S.Y Chong, Y. Tanaka, M.L Lee</b> - <i>CI and CKo Triaxial Tests for Tropical Residual Soil in Malaysia</i>
19	<b>S.S. Liew, Jason A.H. Lim, Y.L. Chin</b> - Review of Interpretation Method of Global Strain Measurement in Pile Testing
20	<b>S.S. Liew, Jason A.H. Lim, Y.L. Chin</b> - Effectiveness of Pile Debonding Materials with Pile Global Strain Measurement

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No.	Author(s) - Paper Title
21	<b>P.T. Lee, K.L. Kwang, K.I. Kasim, A. Azhar</b> - Hand-Dug Caisson Piles in Granitic Formation, Penang
22	<b>Y. Yokota, K. Date, H. Tobe, D. Fukushima, S. Kurokawa</b> - Real-time Evaluation of Tunnel Face Condition using Laser Distance Measurer
23	<b>C.S. Chen, P.K. Yeow, S.C. Lee, Z.H. Teh, K.C. Chan</b> - Measurement of Shaft Friction of Bored Pile in Granite Formation
24	<b>S.K. Lee, Y.W. Chong, H.G. Li</b> - A Novel Approach to the Performance Evaluation of a 2500mm Ø Working Test Bored Pile Using Bi-Directional Static Load Test (BDSLT) Method
25	<b>H.W. Xiao, T.G. Ng, E. Lim, S. Tjahjono, B.K. Hong</b> - Impact Assessment on Existing Building Due to Deep Excavation
26	<b>C. Im, J.K. Tay, P. Braun</b> - Geotechnical Design and Construction Aspects for an Underground Cut-and-Cover Tunnel Over an Existing Road Tunnel Box
27	<b>M. Karthikeyan, C. Joseph</b> - Interpretation of Nuclear-Density Cone Penetrometer for Layered Soils
28	<b>K. Kawano, Y. Kitamoto, T. Yoshida, T. Mikami, T. Ikejiri, J. Wu</b> - Evaluation of Deformation and Strength Characteristics of Soils by Falling Ball Inspection and Its Practical Use as Quality Control
29	<b>W.T. Lai, Q. Y. Ye, B.Y. Lim, C. Veeresh</b> - Application of Observational Method in ERSS System
30	<b>C.C. Ng, C.W. Ong, N.H. Choong, R.F. Shen, P. O. Y. Sun</b> - Design Challenges of Bored Tunnelling for Deep Underground Water Pipe Installation in Downtown Singapore
31	<b>M. Karthikeyan, C. Joseph</b> - Rainfall Thresholds for Forecasting Landslides in Singapore
32	<b>S.C. Ng, C.J. Wong</b> - Design and Settlement Monitoring of Embankment on Soft Ground in Southwest Sabah
33	<b>F. Phangkawira, C.S. Choo, D.E.L. Ong</b> - Usage of Pressuremeter Tests in Highly Fractured and Weathered Phyllite for the Assessment of Jacking Forces
34	<b>C.S. Choo, D.E.L. Ong</b> - Generalised Tangential Approach for Characterisation of Strength Parameters for Pipe-Jacking Work in Weathered Rocks
35	<b>M.I. Peerun, D.E.L. Ong, C. Desha, E. Oh, C.S. Choo</b> - Recent Advancements in Fundamental Studies of Particulate Interaction and Mechanical Behaviour Using 3-D Printed Synthetic Particles
36	<b>M. Sams, W. He, B. Kok</b> - Reliability-based Design Criteria of Post Construction Settlement and Global Stability for Port Reclamation in Kalibaru, Indonesia
37	<b>P.T.Lee, Y.C.Tan, B.L. Lim, W.H.Ng</b> - Design and Construction of Driven Piles Over Klang Clay
38	<b>N.N.Nik Daud</b> - Dynamic Cone Penetration (DCP) Data Analysis in Designing Shallow Foundation
39	<b>J.K.H. Lim, M-T. Hortmann, S. Ebbert, R. Durand</b> - Geosynthetic Concrete Formworks for Pipeline Covers enhancing the Safety against Buoyancy, Uplift and Mechanical Damages
40	<b>B.P Tee, S.C. Lee, M.F. Chong</b> - Assessment of Long Reinforced Concrete Piles Response under Axial Load Test using Distributed Fibre Optic Strain Sensor

## **OPENING ADDRESS, KEYNOTE TITLE & ABSTRACT**

**Professor Charles W.W. Ng**

### **Impact Mechanisms of Debris Flow on Rigid and Flexible Barriers**

Many cities such as Kuala Lumpur, Hong Kong, Seoul and Taipei are threatened by debris flows constantly. The dynamics of debris flows are fundamentally governed by the interaction between the solid and fluid phases. To protect vulnerable densely populated urban areas, structural countermeasures such as rigid and flexible barriers are commonly installed to intercept mass-wasting processes. The current design approaches used to estimate impact load is to treat debris flow as an equivalent fluid without considering solid–fluid interaction separately from other factors. In this lecture, a series of centrifuge model tests will be reported to investigate the influence of solid and fluid phases on single-surge debris flow impact on a rigid barrier and a newly developed novel flexible barrier. The effects of solid–fluid interaction were captured by varying the solid fraction of the flows. Impact mechanisms between debris flow and a barrier will be revealed and design implications will be discussed and highlighted.

**Professor Phoon Kok Kwang**

### **Model Factors for Foundation Design - A Comprehensive Review**

The calculated response from a numerical model will deviate from the measured one given the presence of modeling idealizations and real world construction effects. This deviation can be directly captured by a ratio between the measured and the calculated quantity. The ratio is also called a model factor in many design guides and codes. The probabilistic distribution of the model factor is arguably the most common and simplest complete representation of model uncertainty. The characterization of model uncertainty is identified as one of the critical elements in a geotechnical reliability-based design process in Annex D of ISO 2394:2015 “General Principles on Reliability of Structures”. This keynote paper presents a large generic database (PILE/2739) that contains 2739 field load tests conducted on various piles and installed in different soils and countries. The bias (mean) and dispersion (COV) of the model factor for a range of foundations, geomaterials, and calculation models at the ultimate limit state are summarized in a form suitable for adoption in design and codes of practice. Based on this summary, it is proposed that a model factor for a design model can be classified as: (1) moderately conservative ( $1 \leq \text{mean} < 2$ ), (2) highly conservative ( $2 \leq \text{mean} < 3$ ), or (3) very highly conservative ( $\text{mean} \geq 3$ ). The model uncertainty can be classified as: (1) low dispersion ( $\text{COV} < 0.3$ ), (2) medium dispersion ( $0.3 \leq \text{COV} < 0.6$ ), (3) high dispersion ( $0.6 \leq \text{COV} < 0.9$ ), and (4) very high dispersion ( $\text{COV} \geq 0.9$ ). These model factors are necessary for the calibration of resistance factors in the Load and Resistance Factor Design.

**Ir. Dr Chan Sin Fatt**

### **Managing Geotechnical Risks in Engineering Practice**

Geotechnical risks represent one of the most enduring challenges in civil engineering projects since the time of Terzaghi many decades ago. This remains the case even at present. Geotechnical risks have a significant impact on both design and construction in all geotechnical work; and therefore require serious attention. Inadequacy in taking care of geotechnical risks can result in distress or failure of the project. This is in spite of advances in theory, site investigation, analytical procedures and performance monitoring. The primary reason for this present situation is that all civil engineering projects involve the ground which is formed by Nature, and is therefore inherently variable, even within the same project site. In addition, ground properties are usually complex. This is in contrast to structural engineering where the materials, such as steel and concrete, are man-made.

This Paper explains the causes of geotechnical risks, how they arise and how they impact engineering projects in terms of cost overrun, completion delay and public safety. Unfortunately, geotechnical risks cannot be eliminated entirely; however, they can be reduced to manageable levels if appropriate steps are taken. Few papers have been published on the subject of managing geotechnical risks. This Paper is aimed at providing broad guidelines for managing such risks in individual projects. Some of the important factors governing geotechnical risks are discussed in depth, such as: site investigation, uncertainty in geotechnical work, benefits and risks of computer analysis in design and limited accuracy of geotechnical design calculations. To be successful in geotechnical work, it is crucial to manage geotechnical risks by : (1) having a good site investigation which is adequate, well planned and properly executed; (2) adopting a robust design approach which will take care of the uncertainty arising from ground variability; and (3) carrying out performance monitoring and calibration of design, where necessary, to verify design, and also to build up a database for improving design methodology. In addition to the above, the engineer should also use the traditional skills of good engineering practice, including local experience and sound professional engineering judgement.

**Professor Leung Chun Fai**

#### **Effects of Tunnelling on Adjacent Buildings and Foundations**

The issue of tunnel-soil-foundation-structure interaction is investigated in this paper. The results of centrifuge model tests conducted to investigate the effects tunnelling on nearby single piles in terms of soil-movement induced lateral and axial pile responses are first reported. This is followed by an analytical study to evaluate the effects of tunnelling on nearby buildings supported on shallow foundations having different degrees of rigidity. A chart is proposed to enable engineers to perform a quick preliminary assessment on possible foundation damage due to tunnelling for buildings having foundation rigidity ranging from flexible to rigid.

**Ir. Associate Professor Dr Hisham Mohamad**

#### **State-of-the-art Instrumentation of Slopes and Retaining Structures with Fibre Optic Sensors**

In recent years, several fibre optic sensors (FOSs) have been proposed for measurement of strains in geotechnical applications, including landslide monitoring. Efforts have been made in the last ten years or more to correlate between the dynamics of landslides and the strain measured by optical fibre sensors. The embedded FOS can be in the form of inclinometer tube, extensometer, geo-textiles, soil nails, ground anchors, and many more. Distributed Optical Fibre Strain Sensing (DOFSS) technology on the basis of Brillouin Optical Time Domain Reflectometry/ Analysis (BOTDR or BOTDA) offers new possibilities of detecting deformation of large ground mass and able to pinpoint accurately the location of ground slip (the boundary of failure zones of a certain landslide). The sensor is capable of measuring strains along a standard telecommunication optical cable of up to 50 km long with an accuracy of 10 microstrain. Because of the sensing system's capability of measuring continuous strain profiles and its geometric adaptability in that it can be configured to many shapes, the sensor can be either embedded in the ground in the form of borehole inclinometer, or on the slope surface as ground wire extensometer. An overview of BOTDR/A measuring techniques developed for slope monitoring and earth retaining structure is presented through recent studies reported by various researchers worldwide. This article critically assesses the suitability of deploying such technology, particularly factors concerning to installation layout, sensor protection, temperature compensation, cost, and data interpretation.

**Er. Dr Ooi Poh Hai**

**Application of Soil Nailing for Basement Construction in Urban Area**

Soil nailing is a well-developed, effective and optimized earth stabilising system. However, its application for basement construction in urban area is relatively uncommon. This paper presents a case study for a basement construction in densely developed urban area with soil nailing as the main temporary earth stabilising system, in the form of soil nailed slopes, soil reinforcements with contiguous bored pile walls, and temporary earth supports at utility gaps. Design analyses by finite element method and nail force designs in compliance with the latest Code of Practice are described.

The paper will also highlight the importance of adopting correct nail stiffness in design analyses. At the end of the paper, comparison of actual site performance with design predictions are presented.

**Ir. Dr Toh Cheng Teik**

**Ground Movements Due to Bored Piles and Basement Construction**

Construction of bored piles and basement excavation both causes soil movements and can affect nearby structures and infrastructures. Measurements at various sites show that ground movements due to bored pile installation can be significant compared to basement excavation. Yet assessment of the effects of foundation and basement construction are focussed only with the latter. Ground settlement and vibration measurements during individual pile installation show low levels of vibrations and ground settlements that appear to be more pronounced for larger diameter and longer piles. Permissible movements are small and methods for reducing lateral movements of embedded walls have been developed. Assessment of the effects of basement excavation on nearby tunnels and piles has to be by use of three dimensional coupled effective stress analysis. Cases of three dimensional analyses are presented and results compared with measurements.

**Er. Chua Tong Seng**

**Ground Freezing for a Rail Tunnel in Singapore**

Ground Freezing (GF) is a method of freezing the ground to improve its engineering properties for construction works. The method has been used for the first time for a railway project in Singapore. This paper presents the analysis and planning of a GF for the construction of a tunnel. The behavior of the existing structures due to GF was analysed using a FEM 3D program. The focus of this paper will be the method of freezing, design considerations, control measures and site monitoring. The experience gained from this project will be invaluable and can serve as lessons learnt for future deep excavation and underpinning projects underneath existing sensitive structures which are increasingly becoming unavoidable.

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	Vivek Venkiteswaran
	Darren
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# GUIDELINES FOR PARTICIPANTS

Dear Participants,

**WELCOME TO THE 1<sup>ST</sup> MGS – GEOSS GEOTECHNICAL CONFERENCE 2019: GEOTECHNICS IN URBAN INFRASTRUCTURE.**

*In order to facilitate the operation of this 1<sup>st</sup> MGS – GEOSS Geotechnical Conference 2019, the Organising Committee would like to seek your co-operation in the following:*

## REGISTRATIONS

The registration will be at located at foyer of the Kristal Ballroom, West Wing, Hilton Petaling Jaya, Selangor.

## NAME TAGS

All participants are advised to wear their name tags at all times during the Conference so that they can be easily identified. Participants without name tags may be refused entry to all technical sessions and other official functions organised for the Conference.

## SECRETARIAT

The Conference Secretariat Room is located at Kristal Suite 3, 1<sup>st</sup> Floor, West Wing, Hilton Petaling Jaya, Selangor.

## SAFE KEEPING OF BELONGINGS

Participants are advised to take good care of their belongings.

**The Organising Committee and Hotel does not provide security for the event and function space and all personal property left in the event or function space is at the sole risk of the owner. All personal items such as camera, wallets, hand phones, and any valuable items should not be left unattended.**

## USAGE OF HANDPHONE

Handphones should be on silent mode during the Conference session.

## PARKING AT THE HOTEL PREMISES

A flat rate of **RM 12.00 per entry** would be charged. Participants are requested to validate their parking tickets (at foyer of ballroom / reception counter) before exiting hotel premises.

## OPENING CEREMONY

Ir. Yee Yew Weng, Organising Chairman of this 1<sup>st</sup> MGS-GEOSS Geotechnical Conference 2019 will officiate the Opening Ceremony at 9.00am on Monday, 24<sup>th</sup> June 2019 at Kristal Ballroom 1, West Wing, Hilton Petaling Jaya, Selangor.

## **PARALLEL SESSION**

There are 2 parallel session after morning and afternoon tea breaks for both Conference days. The 2 separate room namely; Kristal Ballroom 1 (300 pax seating arrangement) and Intan Suite (150 pax seating arrangement) will be located at 1<sup>st</sup> Floor, West Wing, Hilton Petaling Jaya, Selangor.

## **CLOSING CEREMONY**

Ir. Yee Yew Weng, Organising Chairman of this 1<sup>st</sup> MGS-GEOSS Geotechnical Conference 2019 will conclude the Closing Ceremony at 5.30am on Tuesday, 25<sup>th</sup> June 2019 at Kristal Ballroom 1, West Wing, Hilton Petaling Jaya, Selangor.

## **EMCEE**

Emcee shall provide latest update from time-to-time information and necessary changes.

## **TECHNICAL VISITS (CLOSED FOR REGISTRATION)**

### ***GROUP 1 – SITE VISIT A : MRT INFORMATION CENTRE & CHAN SOW LIN MRT STATION***

Registered participants are required to assemble at foyer of Hilton Petaling Jaya at 7.30am on Wednesday, 26 June 2019. Bus will depart at 8.00am.

### ***GROUP 2 - SITE VISIT A : CHAN SOW LIN MRT STATION & MRT INFORMATION CENTRE***

Registered participants are required to assemble at foyer of Hilton Petaling Jaya at 8.00am on Wednesday, 26 June 2019. Bus will depart at 8.30am.

### ***GROUP 3 - SITE VISIT B: PAVILION DAMANSARA***

Registered participants are required to assemble at foyer of Hilton Petaling Jaya at 8.00am on Wednesday, 26 June 2019. Bus will depart at 8.30am.

## **PRAYER ROOM**

The Muslim prayer room is located at the Level 1, West Wing, PJ Hilton, Selangor.

## **MORNING AND AFTERNOON TEA BREAKS**

The morning and afternoon tea break will be served at the foyer of the ballroom near the registration desk and at the corridor leading to the hotel lobby. Only participants, with name tags will be allowed to enjoy the refreshments.

## **BUFFET LUNCH**

Buffet lunch will be provided for both days of the Conference at the ground floor “Paya Serai Restaurant”.

For the Organising Committee, Invited Guests, and Keynote Speakers, 2 tables have been reserved at Paya Serai at Ground Floor, Hilton Petaling Jaya. Please look out for the RESERVED sign at Paya Serai at Ground Floor, Hilton Petaling Jaya.

## **VEGETARIAN FOOD**

If you require vegetarian food, please inform the Secretariat not later than 9.30am on 1<sup>st</sup> day of Conference.

During lunch, please note that the Organising Committee allocate 1 table at Paya Serai Restaurant located at Ground Floor, Hilton Petaling Jaya for the vegetarian participants. Please look out for the VEGETARIAN signed.

## **PROGRAMME**

The programme booklet, distributed to each participant, contain the programme of the Conference. Participants are advised to take note of the time of each Conference Session, tea breaks and lunches.

## **FLIGHT, TAXI AND OTHER TRANSPORTATION INFORMATIONS**

Please request the Hotel Concierge service counter at the Front Lobby to assist on your transportation details, at your own cost.

## **OTHER INFORMATION**







Should you require any assistance from organisers, please do not hesitate to contact the IEM Academy Sdn. Bhd. Secretariat or any of the Organising Committee Members.

## **RECYCLE CONFERENCE ITEMS**

Participants could RECYCLE unused materials produced from the Conference for future usage. Kindly return the materials to the Registration Counter before exit the Conference.

Thank you and have a fruitful Conference.

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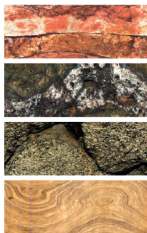
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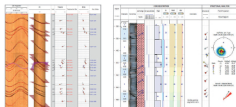


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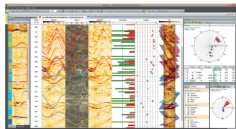


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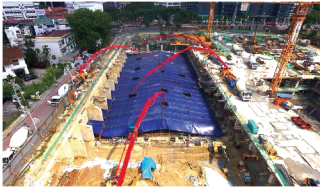
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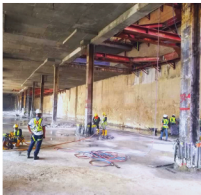
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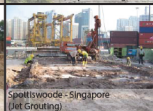
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Geotechnical instrumentation is essential for safety reasons, quality control, optimization of construction and reduction of costs and time.

Wireless network is getting common and economical. Wireless real-time monitoring becomes practical and essential for construction monitoring. Our client is looking for seamlessly, real-time monitoring data, in order to have immediate decision. Real-time monitoring programs are essential to develop warning systems of impending danger from construction activities in any site specific or regional hazard program. The current manual monitoring is severely limited on immediate respond and continuous reading.

We have business partners in Taiwan and Singapore. We are leading specialty of geotechnical instrumentation in Asia. Our mission is to develop a state-of-the-art monitoring solution. We focus on automated, remote and integrated geotechnical instrumentation monitoring systems as well as the development of corresponding database management software.

Currently, we focus on 2 units MRT-2 stations, 4 units of shafts and 4 tunnel alignments projects. Our partners also involve in Singapore MRT project and Taiwan high speed rail project.

## PROJECT LIST

- **PROJECT MASS RAPID TRANSIT LEMBAH KELANG: SG. BULOH - KAJANG**  
(Maluri Station & South Portal, Pudu Launch Shaft - Pasar Seni, Merdeka Station, Muzium Negara & KVMRT V6).
- **PROJECT MASS RAPID TRANSIT: SG. BULOH - SERDANG - PUTRAJAYA**  
(KLCC East Station, Conlay Station, Intervention Shaft-2, Intervention Shaft-3, Escape Shaft-2 & Escape Shaft-3) & ( Tunnel Alignment - TU2, TU4, TU5 & TU6 package)



## OUR SERVICES

### PROVIDING 24-HOURS REAL-TIME AND MANUAL MONITORING WORK

- Real-time monitoring system planning and services
- Dilapidation Survey
- Monitoring instrument consultation
- Geotechnical investigation services
- Monitoring instruments services and supply
- Slope Instrumentation and Monitoring
- Deep Excavation Instrumentation and Monitoring
- Vibration and Noise Monitoring
- Building / Ground Settlement Monitoring.



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+603 9224 6623



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[technical-team@georealtime.com](mailto:technical-team@georealtime.com)



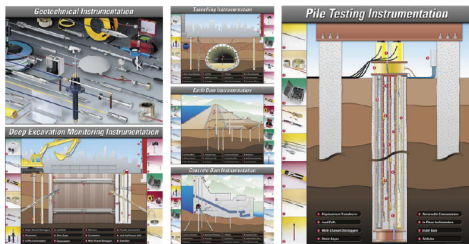
[www.georealtime.com](http://www.georealtime.com)





## SPECTEST SDN BHD

We provide a complete range of high-quality geotechnical instrumentation sales and services suitable for monitoring of Foundation Piles, Deep Excavations, Hillside Development, Slope Engineering and Landslides, Building Settlements, Dams, Tunnels, Environmental and Waste Water, etc...



## GLOSTREXT TECHNOLOGY

We provide a complete range of high-quality MLT pile tests instrumentation services since 1992, as well as providing BDSLT testing services. Scopes including planning, supervision and conducting BDSLT, field instrumentation, data-logging, automatic pile test monitoring, analysis and reporting works for foundation piles. Our innovative Glostrext Method has been used in more than 200 projects for the instrumented static load tests on driven, jacked-in and bored piles in Singapore for the past 5 years.



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MS ISO 9001 REG. NO. AR 4349

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Jack-In Pile (M) Sdn. Bhd. is the pioneer and leading specialist contractor for the hydraulic jack-in piling system with operations in Malaysia, Singapore and Australia. With the advantages of being both environmental friendly and efficient, this piling system commands an exceptionally strong presence in the urban areas.

Developers tend to favour our hydraulic jack-in piling system as it is practically free from noise, vibration and pollution. Traversing diverse market segments, our project portfolio comprises commercial, industrial and high rise residential projects.

With the largest fleet jack-in hydraulic machines in Malaysia and a staff strength of more than 300 employees, the company has an outstanding track record of excellent project deliveries to clients. As a testimony to our accomplishments, we have completed more than 500 projects over a period of ten years.

We provide environmentally friendly and efficient piling as our machines are:

- **SILENT** : piling without noise pollution
- **VIBRATION FREE** : eliminates the risk of damage to adjacent
- **VERSATILE** : side-jacking allows for piling at confined areas
- **MULTI PURPOSE** : the machine itself acts as kentledge for load test
- **SPEEDY** : jacking speed of up to 5.6 metres per minute
- **PRACTICAL** : on board crane allows for self hoisting of piles
- **MOBILE** : generator attached to machine allows for mobility on site
- **EXPEDIENT** : customized pile-cutter and CO2 welding provides speed safety

## ❖ Mission

- Total Customer Satisfaction
- Resources Optimization
- Wastage Minimization
- On Schedule Completion
- Continuous Quality Management

## ➤ Vision

To be the top value-adding construction service specialist to our customers



[www.jackinpile.com.my](http://www.jackinpile.com.my)

Jack-In Pile (M) Sdn. Bhd.

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Crawler Crane



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Scissors Lift



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**SUNWARD**



Boring Rigs

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**Genie**



Boom Lift

Sole Distributor

**ZOOMLION**



Crawler Crane



**中国中车 CRRC**



Drilling Rig



Certificate No: AJA0310796



Certificate No: AJA069989



Certificate No: AJA01025062



Certificate No: AJA05030347



## GEOTECHNICAL SOLUTIONS

Global Strength and Local Focus

With a solutions approach, we work collaboratively with project teams to unlock savings via our in-depth understanding of ground improvement

### Ground Improvement

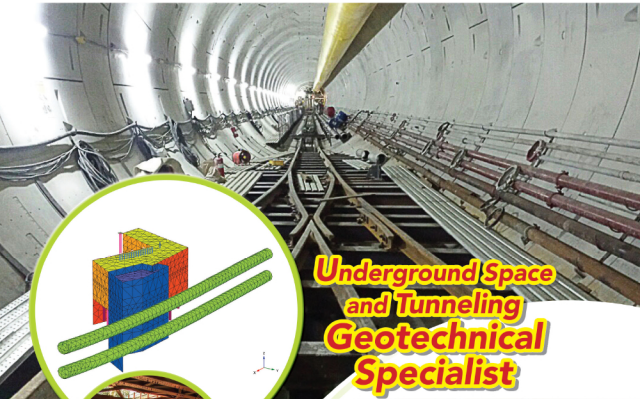
Vibro Compaction  
Vibro Stone Column  
Deep Soil Mixing  
Dynamic Compaction

### Grouting




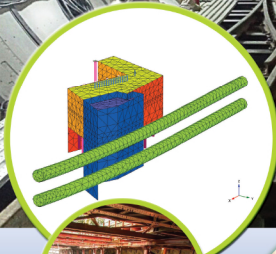
Compaction Grouting  
Jet Grouting  
Soil Grouting  
Rock Grouting

### Small Diameter

Anchors  
Micropile  
Nails



## Underground Space and Tunneling Geotechnical Specialist



**2018 IEM Contribution to Engineering Industry Award  
(Consulting Engineering Practice)**

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Building Solid Foundations



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#### **FOUNDATION WORKS**

**Bored Piles**  
**Driven Piles**  
**Micropiles**  
**Hand-dug Caissons**



#### **EARTH RETAINING**

**Diaphragm Walls**  
**Contiguous Bored Pile Walls**  
**Soldier Pile Walls**  
**Ground Anchors & Strutting**  
**Soil Nailing & Guniting**



#### **OTHER SERVICES**

**Basement Works**  
**Earthworks**  
**Ground Improvement**  
**Civil Engineering Works**  
**Building Works**

KL118

Central i-City

Southville Savanna

Southbrooks Desa Parkcity

Plaza Arkadia | Plaza Mont Kiara

Courtyard Marriot Setia Alam | Pavilion KL

D<sup>E</sup> **300+** Pinnacle Sri Petaling | Geo38

M<sup>I</sup> Guthrie Corridor Expressway | Marimo

M<sup>I</sup> **PROJECTS** Icon City | Kiaramas Ayuria | Sky Residence

B<sup>L</sup> **COMPLETED** Pavillion Hilltop | Marc Services Residence | Eaton

Riveria Sentral - Phase 1 | Lakeville Residence Taman Wahyu | Datum Incity | SPRM

#### **CONTACT US**

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[www.pintaras.com.my](http://www.pintaras.com.my)





# TEST SDN. BHD. (30358-T)

(Established in 1976)

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☎: 03-5122 3688 Fax: 03-5121 1688 Email: [sectests@msia.com](mailto:sectests@msia.com); [choongpekkem@gmail.com](mailto:choongpekkem@gmail.com) Website: [www.testsb.com.my](http://www.testsb.com.my)

CIDB Grade G7 Category B & CE Registration No. 1961207-SL018416 ; PKK Gred G7 Category B & CE

## MS ISO 9001 : 2015

Scope of Registration:

### PROVISION OF LABORATORY AND FIELD TESTING SERVICES ON

### CIVIL ENGINEERING MATERIALS, SOIL INVESTIGATION AND GEOTECHNICAL INSTRUMENTATION

#### Site Investigation

- ☒ 12 nos. of own S.I. Rigs
- ☒ Deep Drilling to >300m for Dam and Mineral Investigation
- ☒ Piezocene Test (CPTu)
- ☒ Insitu Pressuremeter Test for Soils & Rock (20MPa) – Menard & Oyo Pressuremeters
- ☒ Flexible Dilatometer Test in Rock
- ☒ Insitu Packer Permeability Test for Soils & Rock
- ☒ Insitu Rock Hydraulic Fracture Test
- ☒ Insitu Resistivity Measurement
- ☒ Insitu Determination of Direct Shear Strength of Rock Discontinuities
- ☒ Insitu Large Shear Box Test
- ☒ Insitu Modulus of Deformation of Rock Mass
- ☒ Borehole Televier (Acoustic and Optical) for Discontinuity Survey of Boreholes
- ☒ Borehole Natural Gamma Logging

#### Laboratory Soils & Rock Tests

- ☒ Standard Tests for Soils & Rock
- ☒ Triaxial Tests (CIU, CID & extended tests)
- ☒ Large Shear Box Test
- ☒ Other Rock Tests (Point Load, Triaxial, Tensile Strength, Direct Shear, Direct Shear Strength of Rock Discontinuities, Modulus & Poisson's Ratio, UPV Measurements for Compression & Shear Wave)

#### Concrete

- ☒ Strength Tests (Cube, Cylinder, Modulus, Poisson's Ratio & Core Test)
- ☒ Non-destructive Tests (UPV, Windsor Probe, Rebound Hammer & Others)
- ☒ Durability Tests (Carbonation, Permeability, Half-Cell Potential, Resistivity, Covermeter Measurement including Ferroskan, Chloride and Sulphate Tests)
- ☒ Long Term Tests (Creep, Shrinkage & Other Tests)
- ☒ Impact Echo for determination of Thickness of Concrete from one face and Detection of Defects in concrete
- ☒ Potential Alkali Reactivity Test (Chemical method, Mortar-Bar method & accelerated method)
- ☒ Factory Floor Flatness and levelness measurements

#### Geotechnical & Structural Monitoring/Instrumentation

- ☒ Geotechnical and Structural Monitoring (Manual or Online Realtime)
- ☒ Instruments (Inclinometer, Tiltmeter, EL-BEAM, Standpipes, Piezometers, Pressure Cells, Extensometers, VW & Resistance Wire Strain Gauges, Load Cells & Others)
- ☒ Precise Settlement Monitoring using Precise Level
- ☒ Temperature and strain monitoring (Online Realtime Monitoring)
- ☒ Pile Instrumentation
- ☒ Vibration & Noise Monitoring

#### Steel, Wire Mesh, Bolts & Nuts, Rail Joints & Others

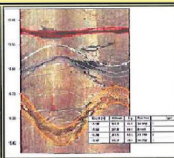
- ☒ Tensile, Bend and Shear Test
- ☒ Slow Bend Test on Rail Joints
- ☒ Hardness & Macro
- ☒ Other Special Tests

#### Bricks, Blocks, Timber & Other Building Materials

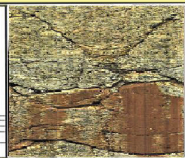
- ☒ Most Standard Tests



Jack-Up Pontoon



Borehole Acoustic and Optical Televier



# Global Expertise Local Knowledge



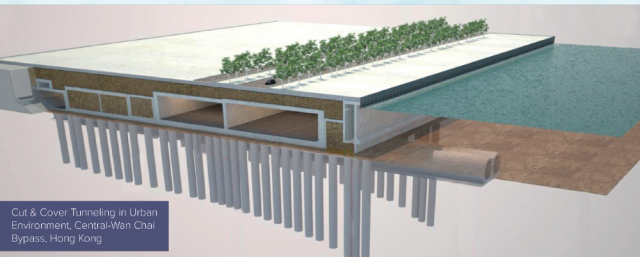
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Kuala Lumpur



Reclamation Works,  
Tuen Mun Chek Lap  
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Our geotechnical services include:

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- Slope stability analyses & ground stabilisation
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## GROUND IMPROVEMENT



Wet Speed Mixing (WSM) is a fast soil mixing procedure acting as an alternative to conventional shoring and foundation method. Benefits include vibration free, high productivity, environmental friendly, and low cost.

**WET SPEED MIXING**



Jet grouting uses ultra high-pressure fluids or binders that are injected into the soils at high velocities. These binders break up the soil structure completely and mix the soil particles in-situ to create a homogeneous mass.

**HIGH PRESSURE JET GROUTING**



TAM grouting uses Tube A Manchetta pipe and double packer which is carried out by combining controlled fracturing grouting and compensation grouting. Benefits include vibration free and low noise emission.

**TAM GROUTING**



Fissure grouting is defined as the filling of naturally occurring voids or cavities adjacent to the works. The grout fills the fissures to strengthen the ground and to make it more water resistant.

**FISSURE / ROCK GROUTING**



This method is an efficient and cost-effective intermediate foundation solution for the support of settlement-sensitive structures. Environmentally safe with no spoils to remove or treat.

**GEOPIER  
(IMPACT / GROUTED PIER)**



This method reinforces fine grained soils, and stabilizes subsurface voids by the staged injection of low-slump mortar grout. It increases density, friction angle, and stiffness of surrounding granular soils.

**COMPACTION GROUTING**

## Other Scope of Ground Improvement Services

- ✓ Secant and Curtain Soil Mix Piles Wall
- ✓ Chemical / Permeation Grouting
- ✓ Bored / Barrette Pile Base Grouting
- ✓ Vibro Concrete Columns (VCC)
- ✓ Vibro Grout Piles
- ✓ Sink Hole Remedial Works
- ✓ Stone Columns

## Other Scope of Geotechnical Engineering Services

- ✓ Mini Bored Piles
- ✓ VDW Secant Bored Piles
- ✓ Pre-Drilling & Driven Sheet Pile / Soldier Piles / Steel Plate
- ✓ Horizontal Drilling & Rock Coring
- ✓ Extraction / removal of existing Steel Pile, RC Pile & Bored Pile
- ✓ Soil Nailing/ Rock Bolts and Shotcrete
- ✓ Design & Build for Earth Retaining Structure System (ERSS)
- ✓ Foundation Bored Piles / Contiguous Bored Pile Wall
- ✓ Marine Toe Pin / Anchor
- ✓ Load Test Using Reaction Ground Anchor System

## GEOTECHNICAL ENGINEERING



ERSS method uses a combination of high pressure jet grouting and mechanical mixing to form a cylindrical secant grout column wall by cutting and overlapping of the stabilised grout column.

**ERSS / SOIL MIX WALL**



Ground anchors consisting of cables or rods connected to a bearing plate and are often used to stabilize steep slopes or slopes consisting of softer soils, as well as the enhancement of embankment.

**GROUND ANCHOR**



Extraction of rc piles, micro-piles bored piles to facilitate the tunnelling activities which include vertical extraction and inclined coring to remove the pile.

**PILE REMOVAL**

## PLANT & MACHINERIES



**ABI TM18/22, TM22 –  
Telescopic mast**



**Hutte HBR605 –  
Standard Mast**



**Boartlongyear DB520 –  
Short & Standard Mast**



**Silo, Batching Plant  
& HP Pump**



**Mixer &  
Injection Pump**

# ACKNOWLEDGEMENT

The Organising Committee of the Conference would like to express its appreciation and gratitude to all who have contributed to this Conference, including:

- (a) Invited Speakers,
- (b) The Authors of Technical Papers,
- (c) Conference Delegates,
- (d) Sponsors,
- (e) Exhibitors,
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- (g) Volunteers,
- (h) Malaysian Geotechnical Society (MGS) Committees,
- (i) Geotechnical Society of Singapore (GeoSS),
- (j) Event manager, IEM Academy Sdn Bhd

And those names not mentioned in this booklet.

# NOTES

# NOTES



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